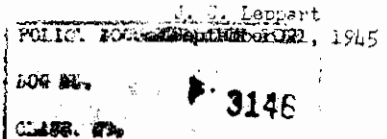


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HISTORY OF TRICHLOROETHYLENE - WORLD WAR II

I. Administration

A. Trichlorethylene has always been under the jurisdiction of the Chemicals Branch. H. J. Lucey handled this product and the other chlorinated solvents from the latter part of 1941 to July 1, 1944, when he left the War Production Board. C. P. Wilson, Jr., handled the product from this time until September 29, 1944. J. G. Fletcher handled the product from this date to the end of the war.

B. In the closing months of the war there was a working agreement with the Chemical Warfare Service covering the operation of their Marshall plant for the production of trichlorethylene at a rate as high as 4 million pounds per month. There was also a working agreement with the Defense Supplies Corporation for the distribution of the output of the CWS Marshall plant. An attempt was made to set up a working agreement with the Foreign Economic Administration to import surplus trichlorethylene production from Canada but no substantial quantities were ever imported. There were no other important inter-relationships with the WPB Divisions or government agencies.

C. There was no Industry Advisory Committee since there were only two producers, Du Pont and Westvaco, with Du Pont making over 90 per cent of the production.

II. Production

A. Bureau of Census production figures for the war period are as follows:

1942 (Last six months)	40,241 tons
1943	103,290 tons
1944	117,867 tons
1945 (First six months)	70,297 tons

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The production increase during the war period was made necessary by heavy demand for the use of this product as a metal degreasing agent. It was used in machines built especially for the purpose which were usually part of production lines in manufacturing plants making war equipment of all kinds, such as airplanes, tanks, guns, ammunition, etc. A large field use for the same purpose developed by the various military branches, particularly the Air Corps.

B. There were no serious raw material problems in connection with the manufacture of trichloroethylene. There were times when it was difficult to supply sufficient calcium carbide for the generation of acetylene and on occasion it was difficult to obtain sufficient supplies of chlorine promptly. In general, these difficulties were minor.

C. The only manpower problem arose at Du Pont's Niagara Falls plant which was in a short manpower area. This affected other products produced at the plant more than it did trichloroethylene.

D. Production was not scheduled but both producers were requested to maintain maximum production at all times, particularly in the closing months of the war when the demand was extremely heavy.

E. There were no serious price problems in connection with trichloroethylene. When production in the Government CWS plant was brought in, it was necessary to work out price situations with Defense Supplies, CWS and the chief distributors. This was accomplished without major difficulty.

III. Expansion of Facilities

A. The production figures are an index of the expansion made during the war period. The Wyandotte plant was brought in during this time to produce approximately 6 million pounds per month. The balance of the

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expansion was at Niagara Falls where two different expansions were made. At the close of the war the capacity by the two industrial producers was approximately 260 million pounds per year. In addition to this, the CWS Marshall plant with very minor changes could have been brought to production of 9 million pounds per month, although 4 million pounds per month was the maximum ever made.

B. All expansion within the industry was privately financed. The CWS Marshall plant, originally built to produce tetrachloroethane and hexachloroethane but converted to trichlorethylene in the closing months of the war, was financed by the Army.

C. No new processes were developed although it is claimed that several process improvements of minor nature were made at Niagara Falls.

IV. Distribution

A. The first control order was issued in October 1941, called M-41 and entitled "Chlorinated Hydrocarbon Solvents." This established a control over carbon tetrachloride, trichlorethylene, perchlorethylene and ethylene dichloride. This was not an allocation order; in effect, it set up a rated and use pattern, establishing preferences for the more important war uses ahead of the less important civilian uses.

There were several amendments to M-41. They were to straighten out various minor difficulties as they arose during the administration of the order. In January 1944, two new M orders were issued (M-163, M-371) one placing carbon tetrachloride under full allocation and the other placing trichlorethylene and perchlorethylene under full allocation. By this time it was no longer necessary to maintain control over the distribution of ethylene dichloride.

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Subsequently, trichloroethylene was placed under M-300 and a separate schedule (94) set up to allocate the product. This allocation order was revoked September 1, 1945.

B. During the periods of short supply and particularly during the closing months of the war, the use was confined almost 100 per cent to the metal degreasing of all sorts of equipment for direct and indirect military use. Very small amounts were released for use in fire extinguishers, certain essential drugs, synthetic rubber manufacture and, occasionally, to some special essential demands. There were periods when the dry cleaning industry was allowed a quota as in the last month or two of the war when supplies were ample to provide small surplus and in the early stages of the war before degreasing demands had reached the peak. All direct military purchases were, of course, honored wherever justified.

C. The period of greatest shortage was from the fall of 1944 to within a month or two of the close of the war. Stockpiles were reduced during December 1944 and, at the same time, production difficulties were encountered in plants. At this point production of war material started to increase rapidly with the result that the demand suddenly became especially heavy. The problem was solved by tightening up on allocation, boosting production in all plants to a peak, and finally converting facilities at the CWS Marshall plant to the production of trichloroethylene, as high as 4 million pounds per month.

D. There were no inventory controls other than through working agreement with the chief producer, the Du Pont Company.

E. Trichloroethylene was never officially programmed since its use was almost 100 per cent for metal degreasing.

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F. During the first half of the war, exports were permitted since supplies were generally ample. During the last half of the war, however, no exports were allowed and all such requests rejected.

V. Stockpiling, Public Purchases and Import Quotas

There were no public purchases or government stockpiling or import quotas. Arrangements were made with the FEA to import material from Canada which never materialized. In the closing months of the war, consideration was given to the creation of a substantial government stockpile and all preliminary arrangements were made. The sudden end of the war eliminated this necessity.

VI. Packaging Problems

Most of the trichlorethylene moved in steel drums and there was the usual difficulty in obtaining ample quantities. However, through cooperation with the Packaging Section, the problem was solved although there were occasional delays in shipment due to drum shortages. The general traffic tie-up in the North in the winter of 1944-45 created difficult situations since carloads of new and returned drums were delayed in transit causing a subsequent delay in packaging and shipment. The movement of as much material as possible in tank car lots was encouraged.

VII. Transportation Problems

There were no serious transportation problems with respect to trichlorethylene. There were the usual delays from time to time as a result of heavy war-time freight movements and there was difficulty, of course, in the winter of 1944-45.

VIII. Reconversion Plans

It is not expected that there will be any reconversion problems with respect to this product. The post-war demand will be heavier than pre-war and it is anticipated that, within a reasonable period of time, present

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productive capacity will be taken up. It is understood that the CNS are desirous of selling their Marshall facilities which can be used for the production of trichlorethylene and other chlorinated chemicals, and it is expected that sooner or later some private manufacturer will engage in production at this point. Several are said to be interested in so doing.